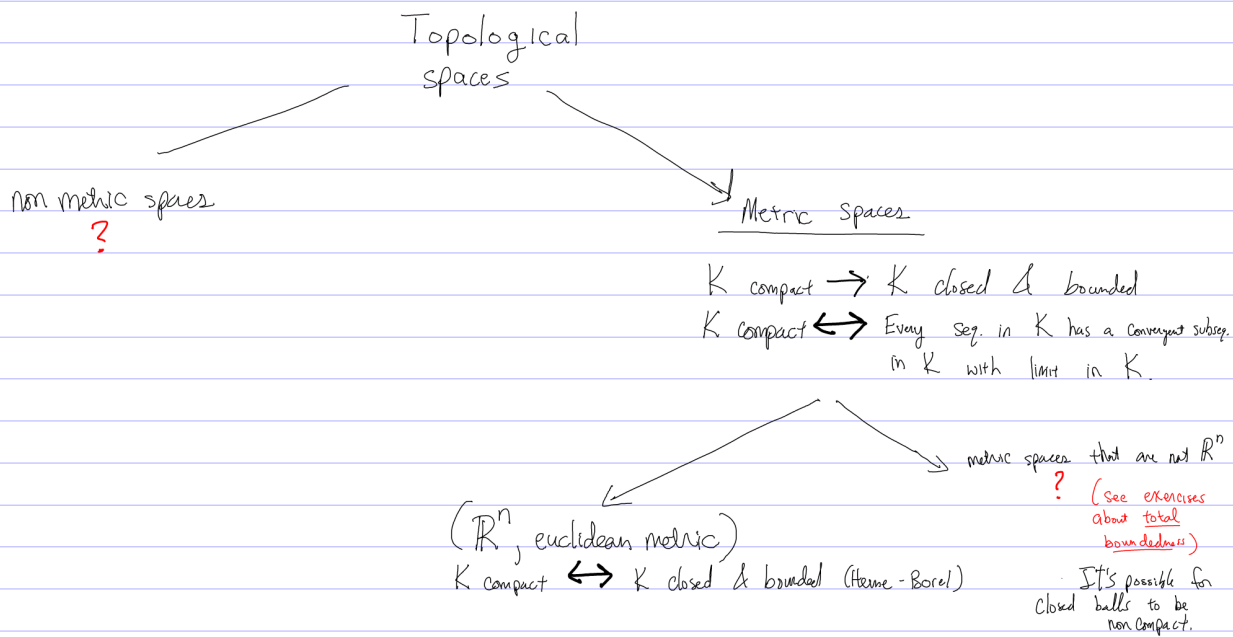


Def Let (X, d) be a metric space and $K \subset X$. The set K is compact if for any collection of open sets $\{U_\lambda\}_{\lambda \in I}$ such that $K \subset \bigcup_{\lambda \in I} U_\lambda$, there exists a finite subset $\{\lambda_1, \lambda_2, \dots, \lambda_k\} \subset I$ such that $K \subset \bigcup_{i=1}^k U_{\lambda_i}$.



Def Let (X, d_x) and (Y, d_y) be metric spaces.

$f: X \rightarrow Y$ is continuous at $c \in X$ if $\forall \varepsilon > 0 \exists \delta > 0$ so that whenever $x \in X$ and $d_x(x, c) < \delta$, then $d_y(f(x), f(c)) < \varepsilon$.

Prop $f: X \rightarrow Y$ is continuous at $c \in X$ if and only if \forall open neighborhood U of $f(c)$ in Y , the set $f^{-1}(U)$ is an open neighborhood of c in X .